

Gregory Margulis – LMS Honorary Member citation

Short citation:

The London Mathematical Society has elected Professor Gregory Margulis, of Yale University, USA, to Honorary Membership of the Society. Gregory Margulis has made revolutionary contributions to the theory of discrete subgroups of Lie groups, ergodic theory and dynamical systems, including applications to graph theory and Diophantine approximation.

Long citation:

The London Mathematical Society has elected Professor Gregory Margulis, of Yale University, USA, to Honorary Membership of the Society.

Gregory Margulis studied under Y. Sinai at Moscow State University graduating in 1970 with a thesis in which he devised a new ergodic method to count geodesics in negatively curved manifolds. Around this time, together with David Kazhdan, he solved a conjecture of Selberg regarding discrete subgroups of Lie groups.

In the 1970's Margulis made ground-breaking contributions to the theory of lattices in Lie groups, establishing the celebrated super-rigidity theorem, the arithmeticity theorem and the normal subgroup theorem regarding lattices in semisimple Lie groups. For this work he was awarded the Fields Medal in 1978.

While working at Institute for Problems of Information Transmission in Moscow, he did pioneering work in graph theory by means of new representation theoretic methods, leading to the first explicit construction of families of expander and Ramanujan graphs. These constructions are now a cornerstone of combinatorics and theoretical computer science.

In the 1980's Margulis wrote an influential book describing the ergodic method he developed to study lattices in semisimple Lie groups, leading to the foundations of the field now known as rigidity theory. At the same time, he started the study of unipotent flows on homogeneous spaces and established the first cases of a celebrated conjecture of Raghunathan, enough to be able to prove the Oppenheim conjecture regarding Diophantine approximation and irrational quadratic forms, a conjecture dating back to the 1930's.

This has led to the development of unexpected connections with number theory and to the field of homogeneous dynamics in contemporary mathematics. Upon moving to the USA in the 1990's and together with his student Dmitry Kleinbock he went on and proved a celebrated conjecture of Sprindzuk on metric Diophantine approximation on manifolds. The new dynamical point of view he introduced has led to a change of paradigm in the field and to many new developments.

Margulis was awarded the Wolf Prize in 2005 and the Abel Prize in 2020 for his achievements. In addition to these accomplishments, he has mentored over 20 Ph.D. students and has shaped a thriving school of mathematics.